

CLAIMS

1. A process for producing nitrogen trifluoride, comprising reacting fluorine gas with ammonia gas in a gaseous phase, wherein the reaction is performed at 80°C or less in the presence of a diluting gas.
2. The process as claimed in claim 1, wherein the reaction temperature is 50°C or less.
3. The process as claimed in claim 1 or 2, wherein the concentrations of fluorine gas and ammonia gas fed are from 1:1 to 1:2 in terms of the molar ratio.
4. The process as claimed in any one of claims 1 to 3, wherein fluorine gas and/or ammonia gas is fed in portions.
5. The process as claimed in any one of claims 1 to 4, wherein the concentration of fluorine gas fed is 3 mol% or less.
6. The process as claimed in any one of claims 1 to 5, wherein the concentration of ammonia gas fed is 6 mol% or less.
7. The process as claimed in any one of claims 1 to 6, wherein the diluting gas is at least one selected from the group consisting of nitrogen, helium, argon, hexafluoroethane and octafluoropropane.
8. The process as claimed in any one of claims 1 to 7, wherein the diluting gas is reused by circulation.
9. The process as claimed in any one of claims 1 to 8, wherein a step of treating unreacted fluorine gas is provided and in the step, unreacted fluorine gas is treated with an aqueous alkali solution and/or alumina.
10. The process as claimed in claim 9, wherein the treatment step is performed at 80°C or less.
11. A nitrogen trifluoride product comprising the nitrogen trifluoride obtained by the production process described in any one of claims 1 to 10.
12. An etching gas comprising the nitrogen trifluoride product described in claim 11.

13. A cleaning gas comprising the nitrogen trifluoride product described in claim 11.